



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/563,592   | 01/06/2006  | Yasumichi Tokuoka    | 126575              | 3424             |
| 25944 7590 03/17/2009<br>OLIFF & BERRIDGE, PLC<br>P.O. BOX 320850<br>ALEXANDRIA, VA 22320-4850 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| ORLANDO, MICHAEL N   |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1791   |             |                      |                     |                  |
| MAIL DATE  |             | DELIVERY MODE        |                     |                  |
| 03/17/2009   |             | PAPER                |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/563,592

**Applicant(s)**

TOKUOKA ET AL.

**Examiner**

MICHAEL N. ORLANDO

**Art Unit**

1791

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4,6,7,12-14 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,7,12-14 and 16-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 02/03/2009.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The arguments and amendments submitted 12/24/2008 have been fully considered and the previous 112 rejection is hereby withdrawn though a new 112 issue has arisen. Also, the merits of the claims remain unpatentable over the prior art as set forth below.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 4, 6, 7, 12-14 and 16-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 18 both claim the value of (A) being less than 10%. There is no discussion found in the disclosure whereby A is set forth as being less than 10%. This appears to be new matter.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 is dependent on claim 3 which is canceled. It is unclear what device the applicant is referring to.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 4, 6, 7, 12-14 and 16-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US 2001/0006451) in view of either Takeuchi (US 5,248,712) or Kagata (US 5,929,727).

Regarding claims 1 and 6, Miyazaki discloses the steps of making a multilayer ceramic device by forming a green sheet by using a green sheet slurry; forming an electrode pattern layer on said green sheet; forming a dielectric blank pattern layer on level difference gap portion on said electrode pattern layer so as to bury the level difference on said pattern electrode layer by using an electrode level difference absorbing dielectric paste; forming a multilayer body by stacking a plurality of stacking units, wherein the stacking unit is said green sheet formed with said dielectric blank pattern layer and said electrode pattern layer; and firing said multilayer body (figures 4 and 5; [0055]-[0062]). The ceramic slurry (applicant's green sheet slurry) comprises a first dielectric colorant powder and a first organic binder ([0056]). The ceramic paste (applicant's electrode level difference absorbing paste) of Miyazaki includes a dielectric powder and an organic binder (abstract; [0035]). Miyazaki also sets forth that the weight ratio (B) can be anywhere from 1-20% ([0064]) and the weight ratio (A) can be 10% ([0135]). Miyazaki further appreciates that plasticizers can be added to the ceramic paste ([0018]).

Miyazaki does not explicitly state using a B-A of 6.8 though as set forth above provides guidance as to suitable choices thereof. Miyazaki also fails to explicitly teach the use of benzyl butyl phthalate (a common plasticizer) in the ceramic paste, but as set forth above does appreciate the use of plasticizers in ceramic paste. In addition Miyazaki teaches the weight ratio of first binder to first powder (A) as 10% and therefore fails to explicitly teach those below 10%.

It would have been obvious to choose a weight ratio B-A of 6.8 because it falls within the ranges disclosed by Miyazaki and would have therefore been known as a suitable option. Note that that courts have held that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). In regard to the binder/powder ratio being less than 10% such would have been an obvious choice because while 10% is utilized by Miyazaki an ordinary skilled artisan would have clearly been motivated to decrease the binder content when balancing factors such as cost, availability and desired functionality (i.e. desired cohesion). An ordinary skilled artisan therefore would have been motivated to use lower binder amounts to reduce cost if less cohesion was appropriate. Also, not that below 10% could merely include 9.99% and as such it would be expected to have almost identical properties. The courts have held that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). In

this case absent unexpected results merely lowering the binder ratio to 9.99% would be expected to produce a dramatically similar end product.

Takeuchi, drawn to green sheet production, recognizes that benzyl butyl phthalate is a suitable plasticizer to be used with binders in the production of ceramic green sheets (column 9, lines 5-10). Kagata, drawn also to the field of dielectric ceramics and green sheets, also discloses that it was known to use benzyl butyl phthalate as a plasticizer in said field (column 3, lines 54-60).

It would have been clear that adding a plasticizer is appropriate since Miyazaki appreciates their use in the ceramic paste. It would have been obvious to use benzyl butyl phthalate in view of either of Takeuchi or Kagata since both disclose that such is a well known plasticizer used in the art of green sheet production. Therefore since Miyazaki discloses the use of plasticizers, but in a general sense and Kagata and Takeuchi merely provide guidance as to what plasticizers are suitable for green sheet production the use of benzyl butyl phthalate as the plasticizer of Miyazaki's ceramic paste would have been both obvious and expectedly successful. As to the relative amounts, absent unexpected results the medication of the ratios of plasticizer and binder would have merely been a design choice based upon the desired level of plasticity, cohesion and cost. It is not expected to lower/raise the plasticizer content to alter the plasticity and it is not unexpected to lower/raise the binder content to alter the cohesion and clearly also decreasing either or both results in both a decrease in functionality of the one decreased as well as a decrease in cost. An ordinary skill artisan

would have been able to determine what levels of each was appropriate for a particular instance.

Regarding claims 2 and 12, the green sheet is made to a thickness of 3um ([0136]).

Regarding claims 4 and 14, Miyazaki discloses that the binder/powder ratio in the ceramic paste is suitable in the ranges of 10.8-15.8 wt% (0064). Miyazaki also discloses the use of two binders making up the binder component and discloses that the ratio of PVB to ethyl cellulose is applicable in a weight percent ratio of about 90 wt% PVB to about 10 wt% ethyl cellulose. These ranges therefore overlap with the claimed ranges and are therefore held as an obvious choice in view of the fact that Miyazaki appreciates the use of the claimed ranges as a suitable choice.

Regarding claim 7 and 20, the interlayer thickness is 2um after firing ([0136]).

Regarding claims 16 and 17, Miyazaki discloses the first organic binder comprising both DOP and PVB ([0135]). Miyazaki also discloses that the green sheet is made to a thickness of 3um ([0136]).

Regarding claims 18 and 19, the same evidence and arguments presented above for claims 1 and 6 are equally applicable here to claims 18 and 19. See claims 1 and 6 above.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 and 18 have been considered but are moot in view of the new ground(s) of rejection.



In view of newly amended claims the action has been modified to better address the new content. It is noted though that applicant's primary contention is the B-A ratio.

The examiner disagrees with the applicant's contention and notes that the applicant is merely looking at the examples and a select few embodiments set forth by Miyazaki. The ranges fall within those deemed appropriate by Miyazaki as set forth and reiterated above.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL N. ORLANDO whose telephone number is (571)270-5038. The examiner can normally be reached on Monday-Thursday, 7:30am-4:30pm, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip C. Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MO

/Philip C Tucker/  
Supervisory Patent Examiner, Art Unit 1791